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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/425,234	10/25/1999	HAMID RABIE	4320-91	9266

1059 7590 10/15/2003

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EXAMINER	
MENON, KRISHNAN S	
ART UNIT	**PAPER NUMBER**
1723	3

DATE MAILED: 10/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-33

Office Action Summary	Application No.	Applicant(s)	
	09/425,234	RABIE ET AL.	
	Examiner	Art Unit	
	Krishnan S Menon	1723	

-- The MAILING DATE of this communication appears on the cover she t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6-11-03* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17 and 27-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-17 and 27-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *29* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

This is a first action on an RCE with claims 1-17 and 27-38 pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6-10 and 27-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1and 27 recite 'recovery cleanings' in indent (A), and claim 6 recites intensive cleaning in the second line, which are not clear to the examiner as to what these steps encompass, and whether the recovery/intensive cleaning is less or more frequent than the 'cleaning events' recited in detail in these claims. Examiner assumes that the 'recovery/intensive' cleaning is less frequent than the 'cleaning events' for examination purposes and that the prior art methods presented in the specification pages 2 and 3 would define the recovery or intensive cleaning.

Claim 33 recites 'decrease in permeability between performances of steps a, b and c is at least as great as increase in permeability ... after steps a, b and c'. Examiner is not clear how the performance would decrease between the steps a, b and c. Examiner considers this claim to mean "decrease in permeability during operation before the cleaning steps to be at least as great as the increase in permeability after cleaning", for the purpose of examining.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-17 and 27-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US 5,403,479) in view of applicant's admission of known prior art.

Claim 1: Smith teaches a method of cleaning membranes immersed in water (abstract, figures) comprising performing one or more cleaning events per week (Fig 4,6) having steps of stopping permeation, flowing a chemical cleaner through the membrane in the reverse direction of permeate flow, resuming permeation, with the weekly CT being between 2000 and 30,000 min.mg/L (table line 9: 100 ppm (NaOCl) * 60 min = 6000 min.mg/L; col 11 line 30-35: duration about 1 Hr; col 15 lines 34-36: concn. At 10 ppm), wherein the cleaning events reduce the rate of decline of the membrane permeability (col 11 line 20 – col 13 line 5).

Smith does not teach the definition of CT as in claim 1(c)(i). However, this is only a mathematical expression of the measure of concentration of the cleaning solution, times the duration of cleaning cycle, for the convenience of the inventors, and is not a patentable limitation.

Smith teaches about performing recovery cleaning by the prior art methods in "Background of the Invention". Smith also teaches "intensive recovery cleaning" as defined by the applicant in the specification page 3 second para, referencing US 5,403,479, in col 19 lines 27-30. However, Smith does not specifically teach performing recovery cleaning from time to time as in claim 1, but teaches the method of back-flushing with a cleaning solution, or the "in situ cleaning", which is like the "cleaning events", instead. It may be noted that a reference is no less anticipatory if, after

disclosing the invention, the reference then disparages it. The question whether a reference "teaches away" from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998)

Smith also does not teach 'performing recovery cleaning' from time to time and 'between recovery cleaning, performing one more 'cleaning events' as in claim 1. Applicants' own admission of 'known process for cleaning membranes' teaches these steps in the specification pages 1-3 (Background of the Invention), especially page 2 lines 6-7. It would be obvious to one of ordinary skill in the art at the time of invention to modify the methods taught by Smith with the 'known process' of cleaning the membrane, or occasionally performing the 'recovery cleaning' as taught by Smith while performing 'regular (in situ) cleaning' as taught by Smith, for more effective cleaning.

Claims 2-4: Smith teaches processing waste water (abstract), and ground water (col 20 lines 35-40) which is well known for drinking. Re the CT values, in these claims, it is only a result effective variable optimizable depending on the feed water quality, quantity, and the process flow rate. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Aller, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). (See also Smith col 19 lines 5-13)

Claims 5 adds additional limitations of pulsed flow for the chemical cleaner and a wait period with the pump off for the chemical cleaner to 'clean'. Smith teaches pulsed flow (col 11 lines 35-50), and wait periods defined as soak (col 14 lines 55-60), or blocking the flow of solution in col 12 line 68 – col 13 line 5.

Claim 6 adds the more intensive cleaning as being 15 days apart, which is a result effective variable (In re Boesch...)

Claims 7-10: the weekly CT values are result effective variables as discussed in claims 2-4 above.

Claims 11-12: the time duration of the pulse and wait are, again, result effective variable (In re Boesch..)

Claim 13: pulses selected to provide chemical cleaner in an area adjacent the membrane: see Smith abstract re the fouling film formed on the outside surface of the membrane, and col 14 lines 33-68 re effect of the cleaning solution on the fouling biofilm.

Claim 14: the pulsing pressure is in the range as in claim 14, since Smith uses min 100 kPa *absolute* pressure (Smith says this as 1 bar or at least 0.1psig, which means the 100kPa is absolute pressure). Since 5 – 55 kPa is above the pressure on the outside of the membrane (which at least would be one atm, or about 1 bar), the pressures are within the same range.

Claim 15: the flow rate of the membrane should be inherently the same in Smith, since Smith uses similar membranes (UF or microfiltration – see abstract). Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In re King, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986)

Claims 16 and 17: removing chemical cleaning before resuming permeation – see col 12 lines 64-66: withdrawing the electrolyte (chemical cleaner) from the lumen before reestablishing normal operation.

Claim 27: all the limitations of claim 27 are already discussed in claims 5-7, except the chemical cleaner concentration between 20 and 200 mg/L and the time period of 10-100 min. Smith teaches these in col 11 lines 32-35 and the table in col 15 at line 9.

Claims 28-30: CT values – result effective variable (In re Boesch)

Claim 31: Smith teaches the membrane as immersed in water, outside of the membrane is in contact with water containing solids and there is no agitation (see abstract; col 1 lines 33-66 and col 2 lines 62-65).

Claim 32: see rejection of claim 6

Claim 33: the performance recovery in the membrane by the cleaning is at least to 70% of the initial flux in Smith (see abstract).

Claim 34: the membrane is hollow fiber (col 15 lines 48-62).

Claim 35: Smith does not teach any agitation.

Claim 36: Flowing chemical cleaner by introducing chemical cleaner to the flowing water – see figures. Smith provides cleaning chemical in a tank which is flowed through the system, in water, which is equivalent to what is claimed.

Claim 37: cleaning at regular intervals and each having the same CT: optimizing a result effective variable, In re Boesch...

Claim 38: replacing some or all of the water in the tank with fresh feed water after step Bb: this means partially or totally draining the tank after the cleaning step, which is taught as not a preferred method by Smith. However, a reference is no less anticipatory if, after disclosing the invention, the reference then disparages it. The question whether a reference "teaches away" from the invention is inapplicable to an anticipation analysis. *Celeritas Technologies Ltd. v Rockwell International Corp.*, 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998)

Response to Arguments

Applicant's arguments filed 6/11/03 have been fully considered but they are not persuasive.

Argument re recovery cleanings and the CT parameter: The 'CT' parameter is only a mathematical expression of concentration of cleaning solution, times the duration of cleaning. This parameter does not necessarily provide a true measure of the efficacy of cleaning because it has no dependency on the membrane area to be cleaned, and the quantity, quality and types of contaminants of raw water processed before the cleaning. One of ordinary skill in the art would know that the degree of fouling of the membrane is dependent on these factors, and the concentration and length of cleaning would depend on the degree of fouling of the membrane. Re whether the Smith methods relate to the cleaning events between the recovery cleanings, it may be noted that all the cleanings are for the reason of recovering the lost membrane performance. Smith teaches all the methods of cleaning as claimed in the instant claims. The only part Smith does not specifically teach is the combination of having more frequent 'cleaning events' between the less frequent 'recovery/intensive cleaning', which is discussed in the rejection.

Arguments re Fig 4 and 6 are moot because the rejection is based on optimization of result effective variables, and what is claimed in the related claims are only results of such optimization.

Argument re the pulsing is discussed in the rejection.

Argument re agitation taught in Smith: Col 17 line 22 in Smith teaches providing air for maintaining the beneficial bacteria, not specifically for agitation. Smith does not talk about agitating the membranes while cleaning. Please note that Smith teaches this same method for hollow fiber membranes inside a housing also, where agitation of the hollow fibers is not practical (Fig 3, col 17 lines 57-68).

Rest of the arguments are covered in the rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon
Patent Examiner

JOSEPH DRODGE
PRIMARY EXAMINER